

WHAT IS CLAIMED IS:

- 1 1. A semiconductor module comprising:
2 a substrate comprising:
3 a base layer having a substantially planar base layer first surface
4 opposing a substantially planar base layer second surface, where said
5 base layer first surface is exposed to atmosphere and where said base
6 layer is electrically conductive;
7 an insulator layer having a substantially planar insulator layer
8 first surface opposing a substantially planar insulator layer second
9 surface, where said base layer second surface and said insulator layer
10 first surface are adjacent and contiguous to one another and where said
11 insulator layer is electrically non-conductive; and
12 a conductive layer having a substantially planar conductive
13 layer first surface opposing a substantially planar conductive layer
14 second surface, where said insulator layer second surface and said
15 conductive layer first surface are adjacent and contiguous to one
16 another and where said conductive layer is electrically conductive;
17 at least one semiconductor adjacent to said conductive layer second
18 surface, where said at least one semiconductor is electrically coupled to said
19 conductive layer; and
20 electrical contacts adjacent to said conductive layer second surface,
21 said electrical contacts electrically coupled to said conductive layer.
- 1 2. The semiconductor module of claim 1, wherein said semiconductor and said
2 electrical contacts are disposed at opposing ends of said substrate.
- 1 3. The semiconductor module of claim 1, wherein said semiconductor and said
2 electrical contacts are disposed in substantially the same plane as one another.

9797-0081-999 RA170CIP

- 1 4. The semiconductor module of claim 1, wherein said base layer is substantially
2 thicker than said insulator and conductive layers.
- 1 5. The semiconductor module of claim 1, wherein a ratio of a thickness of said
2 base layer to said insulator layer is approximately 3.
- 1 6. The semiconductor module of claim 1, wherein a ratio of a thickness of said
2 base layer to said conductive layer is approximately 14.
- 1 7. The semiconductor module of claim 1, wherein said base layer is
2 approximately between 100 and 500 micrometers thick.
- 1 8. The semiconductor module of claim 1, wherein said insulator layer is thicker
2 than said conductive layer.
- 1 9. The semiconductor module of claim 1, wherein said insulator layer is
2 approximately between 25 and 100 micrometers thick.
- 1 10. The semiconductor module of claim 1, wherein said insulator layer is chosen
2 to provide a predetermined electrical impedance.
- 1 11. The semiconductor module of claim 1, wherein said base layer is made from a
2 metal selected from a group consisting of: copper, bronze, stainless steel, and
3 aluminum.
- 1 12. The semiconductor module of claim 1, wherein said insulator layer is made
2 from a material selected from a group consisting of: a polyimide, an epoxy,
3 and teflon.
- 1 13. The semiconductor module of claim 1, wherein said conductive layer is made
2 from a metal selected from a group consisting of: copper, bronze, and gold.

3 14. The semiconductor module of claim 1, wherein said conductive layer forms
4 patterned traces.

1 15. A semiconductor module comprising:

2 a substrate comprising at least two legs joined by a resilient bend, said
3 bend configured to compressibly engage with a female connector, said
4 substrate comprising:

5 an insulator layer that is non-conductive; and

6 a conductive layer adjacent and contiguous to said insulator
7 layer;

8 at least one semiconductor both adjacent and electrically coupled to
9 said conductive layer; and

10 electrical contacts both adjacent and electrically coupled to said
11 conductive layer.

1 16. The semiconductor module of claim 15, wherein said electrical contacts are
2 located near where said bend and one of said legs join.

1 17. The semiconductor module of claim 16, further comprising additional
2 electrical contacts located near where said bend and the other one of said legs
3 join.

1 18. The semiconductor module of claim 17, wherein at least one of said electrical
2 contacts and at least one of said additional electrical contacts are electrically
3 coupled to each other.

1 19. The semiconductor module of claim 15, further comprising a base layer
2 adjacent and contiguous to said insulator layer on the opposite side of said
3 insulator layer to said conductive layer, where said base layer is electrically
4 conductive.

- 1 20. The semiconductor module of claim 19, wherein said insulator, conductive,
2 and base layers are made from a bendable material.
- 1 21. The semiconductor module of claim 19, wherein said base layer is
2 substantially thicker than said insulator and conductive layers.
- 1 22. The semiconductor module of claim 19, wherein a ratio of a thickness of said
2 base layer to said insulator layer is approximately 3.
- 1 23. The semiconductor module of claim 19, wherein a ratio of a thickness of said
2 base layer to said conductive layer is approximately 14.
- 1 24. The semiconductor module of claim 19, wherein said base layer is
2 approximately between 100 and 500 micrometers thick.
- 1 25. The semiconductor module of claim 19, wherein said base layer is made from
2 a metal selected from a group consisting of: copper, bronze, stainless steel, and
3 aluminum.
- 1 26. The semiconductor module of claim 15, wherein said insulator layer is thicker
2 than said conductive layer.
- 1 27. The semiconductor module of claim 15, wherein a ratio of a thickness of said
2 insulator layer to said conductive layer is approximately 5.
- 1 28. The semiconductor module of claim 15, wherein said insulator layer is
2 approximately between 25 and 100 micrometers thick.
- 1 29. The semiconductor module of claim 15, wherein said insulator layer is chosen
2 to provide a predetermined electrical impedance.

- 1 30. The semiconductor module of claim 15, wherein said conductive layer is
2 approximately between 5 to 30 micrometers thick.
- 1 31. The semiconductor module of claim 15, wherein said insulator layer is made
2 from a material selected from a group consisting of: a polyimide, an epoxy,
3 and TEFLON.
- 1 32. The semiconductor module of claim 15, wherein said conductive layer is made
2 from a metal selected from a group consisting of: copper, bronze, and gold.
- 1 33. The semiconductor module of claim 15, wherein said conductive layer forms
2 patterned traces.
- 1 34. The semiconductor module of claim 15, wherein an acute angle is formed at
2 said bend between said legs.
- 1 35. The semiconductor module of claim 15, wherein said legs are substantially
2 parallel to one another.
- 1 36. The semiconductor module of claim 15, wherein one of said legs is
2 substantially shorter than the other of said legs.
- 1 37. The semiconductor module of claim 15, wherein said substrate stratus has a
2 “j” shape
- 1 38. The semiconductor module of claim 15, wherein said substrate stratus has a
2 “u” shape
- 1 39. The semiconductor module of claim 15, further comprising an additional
2 semiconductor adjacent and electrically coupled to said conductive layer on

3 opposing sides of each leg, where said semiconductor and said additional
4 semiconductor share common lead lines and electrical contacts.

1 40. The semiconductor module of claim 15, further comprising multiple legs and
2 bends spanning multiple channels.

1 41. A semiconductor module comprising:

2 a substrate comprising substantially parallel first and second legs
3 joined by a bend, said bend configured to engage with a female connector, said
4 substrate comprising:

5 an insulator layer that is non-conductive; and

6 a conductive layer adjacent and contiguous to said insulator
7 layer;

8 at least one semiconductor adjacent and electrically coupled to said
9 conductive layer;

10 a first set of electrical contacts located on said first leg near said bend,
11 where at least some of said first set of electrical contacts are electrically
12 coupled to said conductive layer; and

13 a second set of electrical contacts located on said second leg near said
14 bend, where at least one of said first set of electrical contacts and at least one
15 of said second set of electrical contacts are electrically coupled to one another.

1 42. A method for making a semiconductor module, comprising:

2 forming a substantially planar substrate by:

3 providing a base layer that is conductive;

4 applying an insulator layer onto said base layer, where said
5 insulator layer is non-conductive; and

6 coating said insulator layer with a conductive layer;

7 etching traces and electrical contacts onto said conductive layer; and

8 electrically coupling a semiconductor to said conductive layer.

1 43. The method of claim 42 further comprising bending said substrate near said
2 electrical contacts through an angle of approximately less than 180 degrees.